CHAPTER 5. HABITAT STUDIES

HABITAT QUANTITY

Habitat quantity was determined using airborne videography as previously described by Bliesner and Lamarra (1998) and established as part of the Long Range Monitoring Program. Habitat types mapped can be seen in Table 5.1 with habitat categories summarized into seven general categories. Mapping occurred between November 16 and December 4, 1999 between RM 2 and RM 180. Flows during the habitat mapping ranged between 840 and 910 cfs. Run habitats had the most surface area with 81.9 percent of the wetted area of the San Juan River. Riffles were second most dense (7.37%), followed by shoals (7.0 %) and slackwaters (1.70 %). Backwaters made up only 0.33 percent of the surface area of habitats (Figure 5.1). The spatial distribution of these same general categories can be seen in Figures 5.2 and 5.3. Low velocity and backwater habitats were distributed throughout the river but are in highest magnitude between RM 68 and RM 105 (19,760 m^2).The second location of relatively high backwater densities was between RM 131 and RM 154 with a total area of 14,375 $m^{2.}$ Shoals which are the third most dense habitat type are found throughout the river system but are a major habitat feature in the lower 19 miles of the San Juan River where it is influenced by the backwater effects of Lake Powell. Slackwater habitats are mostly found between RM 20 and RM 80 and are associated with riffle complexes within the canyon bound reach of the river.

Table 5.1. Seven general categories of habitat types on the San Juan River.

LOW VELOCITY TYPES	RUN TYPES	RIFFLE TYPES	BACK-WATER TYPES	SHOAL TYPES	SLACK-WATER TYPES	VEGETATION ASSOCIATED HABITAT TYPES
pool	shoal/run	riffle	backwater	sand shoal	slackwater	overhanging vegetation
debris pool	run	shore riffle	backwater pool	cobble shoal	pocket water	inundated vegetation
rootwad pool	scour run	riffle chute	embayment			
eddy	shore run	shoal/riffle				
edge pool	undercut run	chute				
riffle eddy	run/riffle	rapid				

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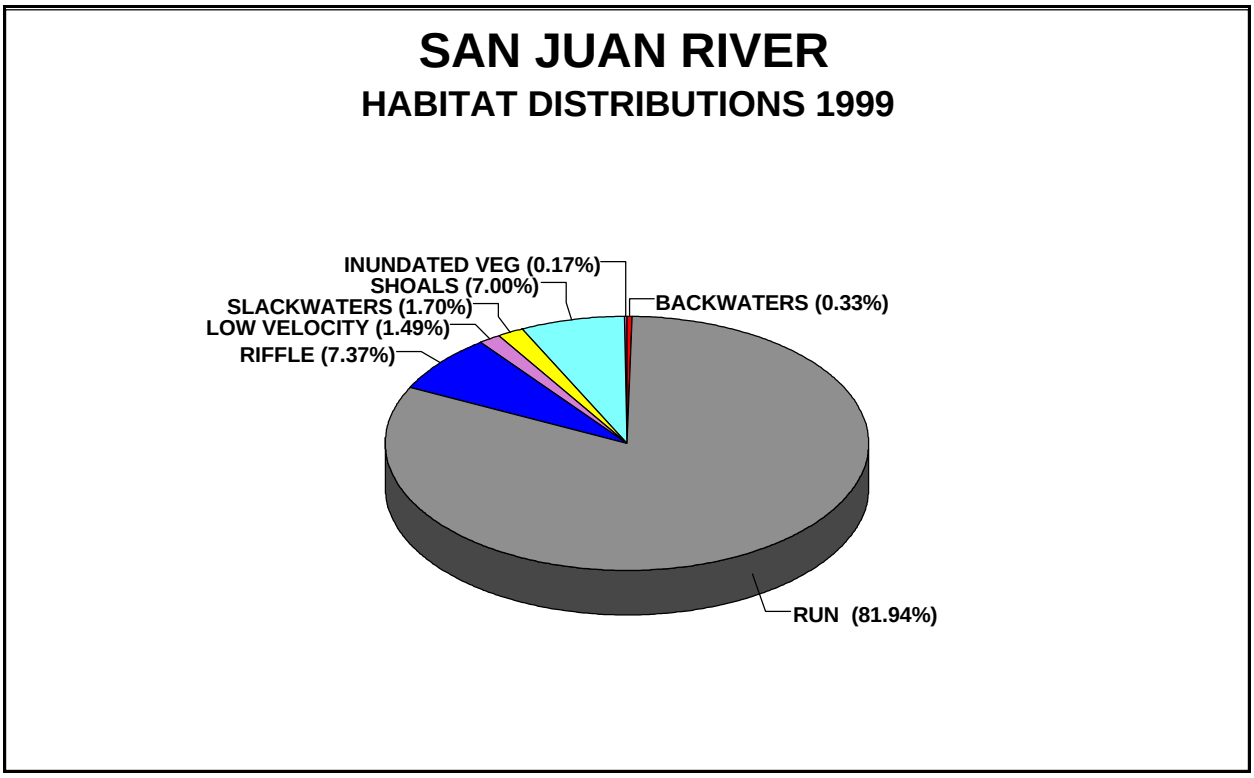

Figure 5.1. The distributions of habitat types (expressed as a per cent of total wetted area) in the San Juan River in 1999. Data are for RM2 to RM 180.

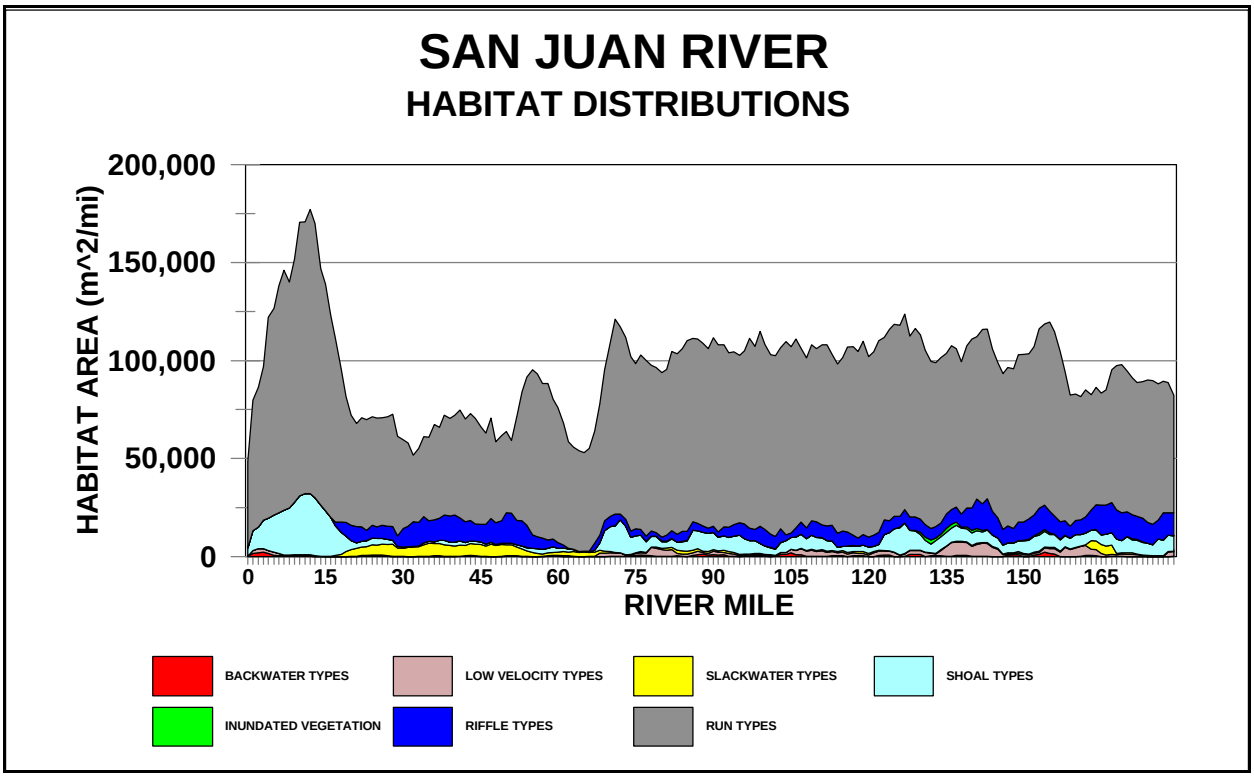

Figure 5.2. The spatial distribution of the major habitat types in the Sam Juan River from RM 2 to RM 180 in November and December 1999.

GO TO 1999 REPORT

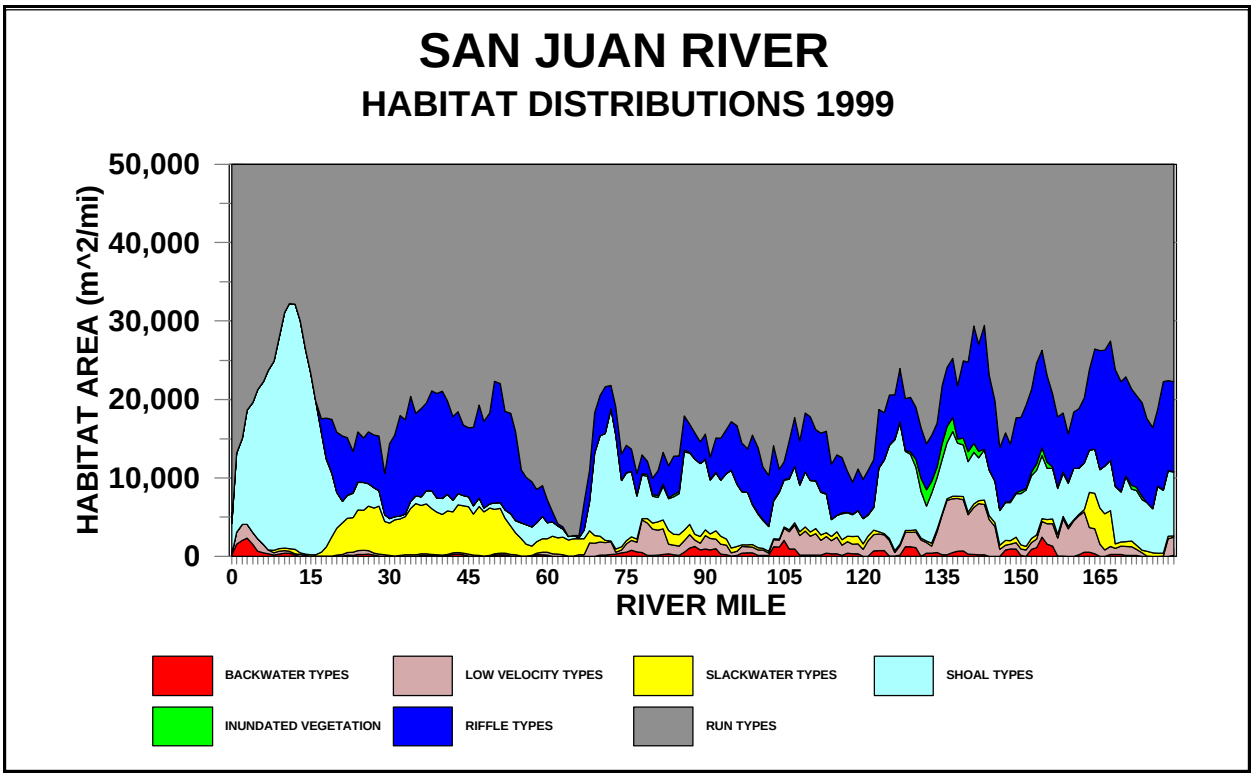

Figure 5.3. The spatial distribution of the major habitat types with the run habitats not shown in order to demonstrate more detail in the less dominant types.

Backwater habitats represent an important component of the life cycle of many of the native species found in the San Juan River. Because of this fact, the temporal trend of this habitat type is used as a monitoring indicator to assess influences of flows on habitat quantity. As noted in previous investigations (Bliesner and Lamarra 1998), the magnitude of backwater habitats are influenced by the location in the river, flow magnitude, and summer storm events. In order to simplify the analysis, only mapping runs between 800 and 1200 cfs are used in a comparison of temporal trends. These data are shown in Figure 5.4 for both surface area and the number of backwaters. The data indicated that after reaching a maximum surface area of 143,000 m^2 (373 backwaters) between RM 2 and RM 180, there was a decrease to 43,000 m^2 (164 backwaters) in November 1998. The loss of the 100,000 m^2, or 200 backwaters, primarily occurred in reaches 3 and 4. In the 1999 inventory, backwaters slightly increased to just over 56,300 m^2 (Figure 5.4) in 178 backwaters.

GO TO 1999 REPORT

HABITAT QUALITY

The depths of backwaters is an important attribute relative to use by native endangered species. In the San Juan River system, backwater depths are effected by sediment laden summer storms. Bed sediment depths in backwaters have been periodically measured since August 1995. A good example of the influence of storms can be seen during August, September and November 1995. Seven storms during the summer and fall of 1995 deposited an average of 0.5 meters of sediment in backwaters (Figure 5.6). Since 1995, summer sediment depths have ranged river-wide between 0.2 and 0.4 meters in depth. In the fall of 1997, sediment depths again reached almost 0.6 meters.
The December 1999 monitoring of backwater sediment depths indicated that sediment depths were the second most shallow (average 0.14 meters and SD 0.04 meters) since the August 1995 sampling. The deepest sediment depths were in reach 2 (average 0.22 meters and SD of 0.03 meters) and the most shallow in reach 4 (average 0.09 meters and SD of 0.03 meters).

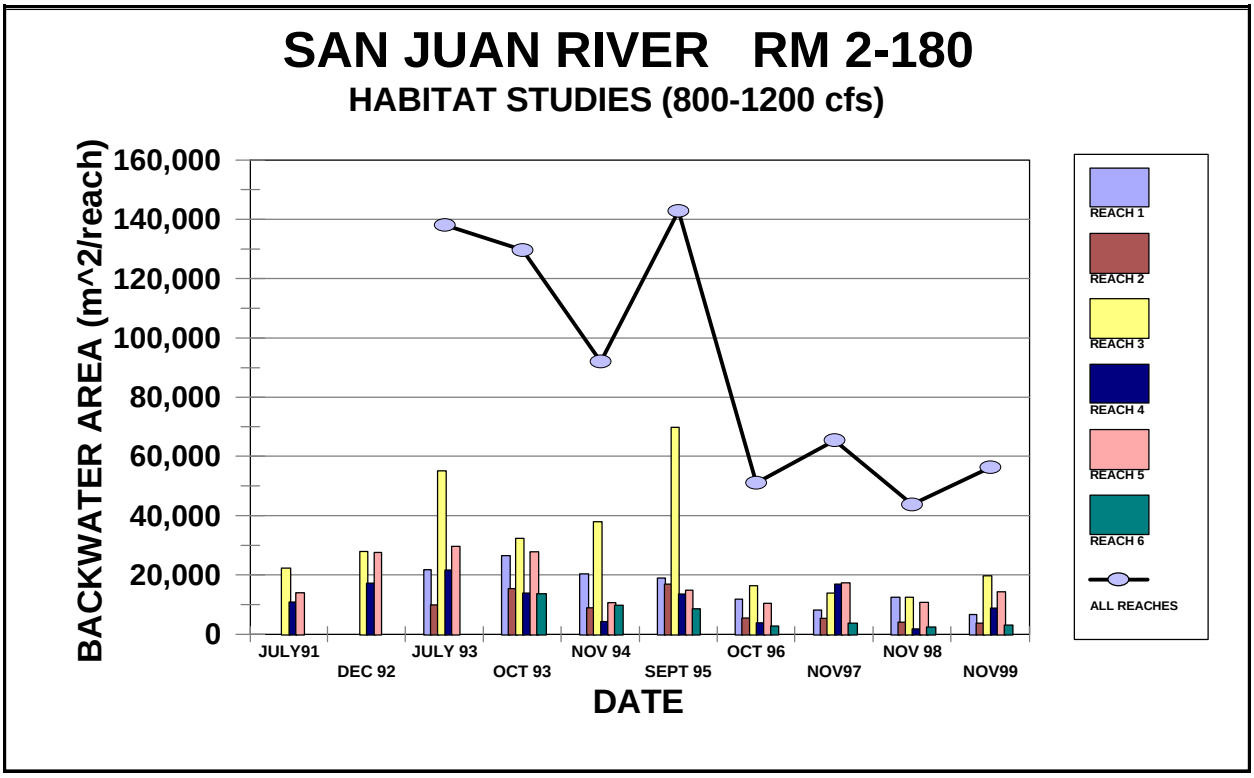

Figure 5.4. The distribution of backwater habitat area by reach and total for each mapping date where flows were between 800 and 1200 cfs.

GO TO 1999 REPORT

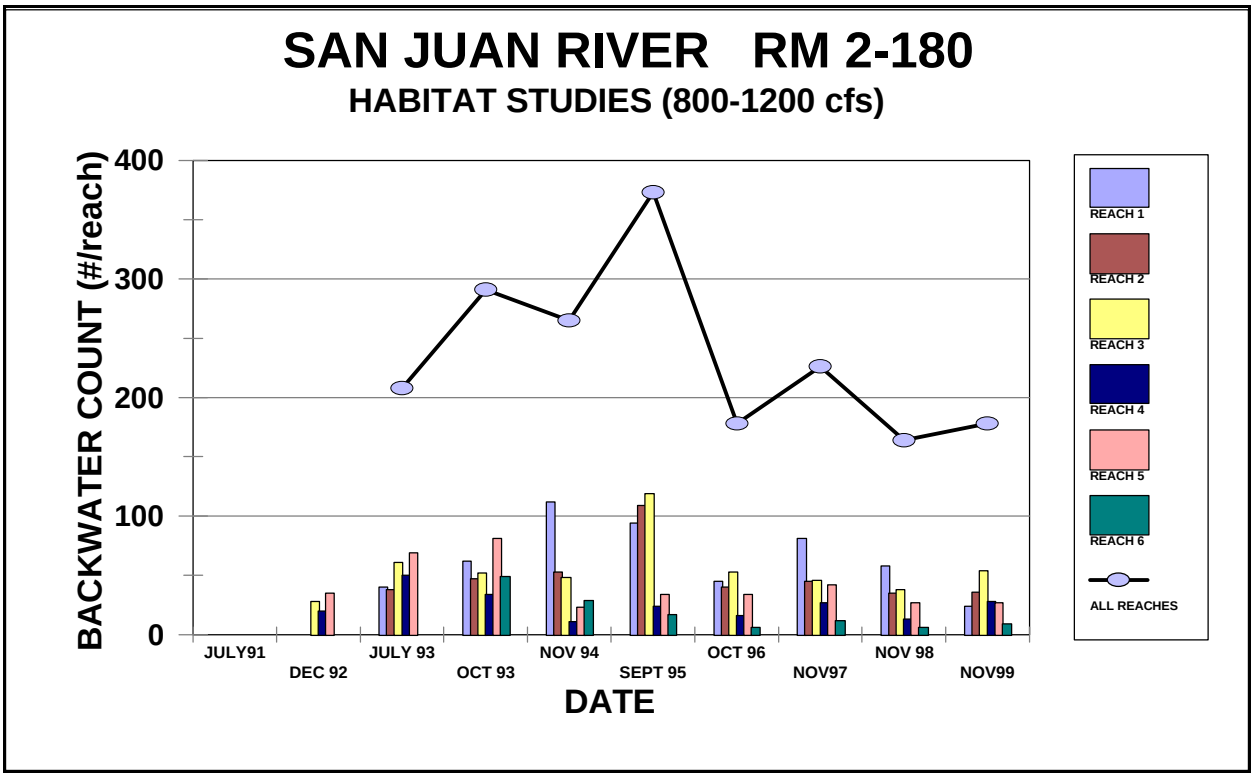

Figure 5.5. The distribution of backwater habitat counts by reach and total for each mapping date where flows were between 800 and 1200 cfs.

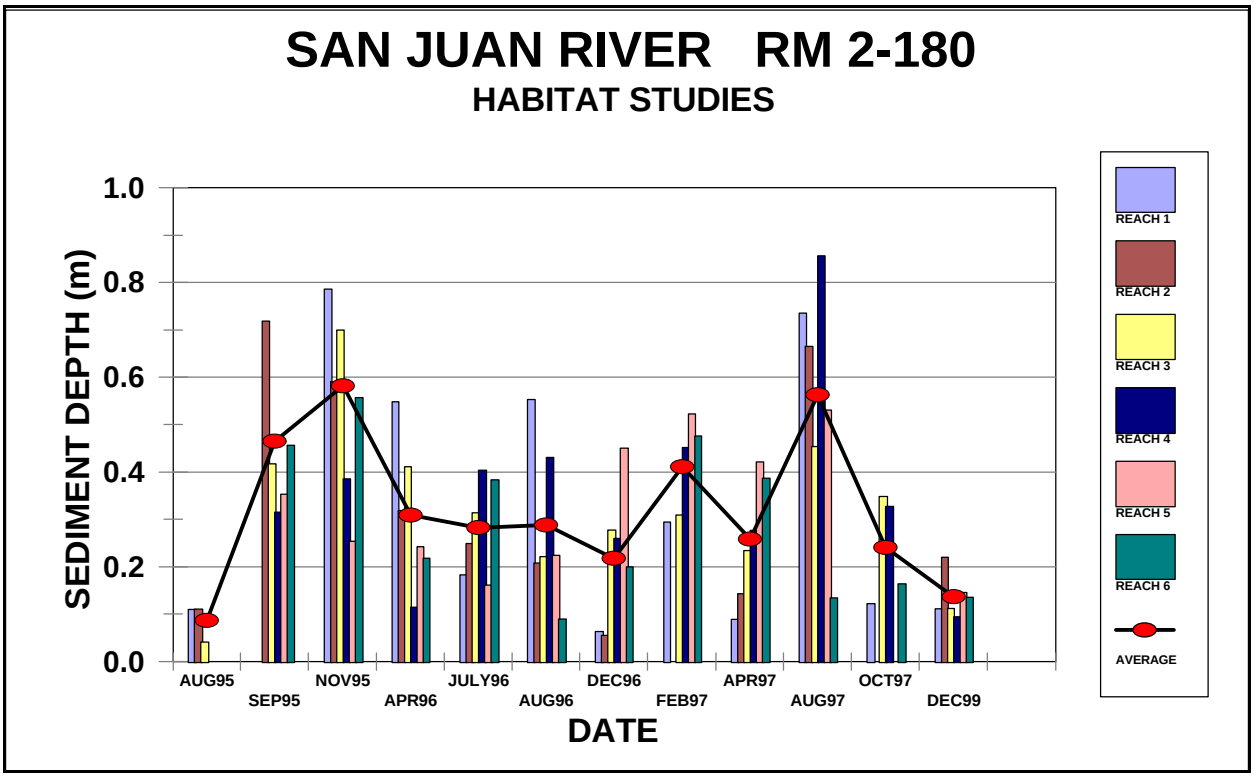

Figure 5.6. The depth of sediment (meters) in backwaters displayed by reaches from the San Juan River.

GO TO 1999 REPORT